# The use of electronic telemetry to monitor Atlantic salmon at sea

**Frederick Whoriskey**, Executive Director, Ocean Tracking Network, Dalhousie University, Halifax, NS, B3H 4R2, Canada fwhoriskey@dal.ca

Recent downturns in Atlantic salmon returns to rivers in both North America and Europe appear in large measure to be due to factors affecting salmon while they are at sea, especially in the early period of their sea migration. The responsible factors are at present speculative because we have historically been unable to follow the animals in the ocean, leaving their lives there a mystery. Powerful new electronic tagging technologies (satellite tags, data-storage tags, acoustic tags) have the potential to assist us to document the times salmon use different places (habitats) in the ocean places, their positions in the water column and in some cases the environmental conditions that may be influencing their behavior. Unfortunately, no single technology is capable of answering all of the questions we would like to ask a salmon about its life in the ocean. Satellite tags due to their size can only be used on adult salmon. Data-storage tags have also until recently been too large to use on smolts, but miniaturized models are now available. The tags must be retrieved to access the data that they contain, which means the fish must be caught by a fisherman or more commonly be trapped in a counting facility as they enter rivers to spawn. This means that we learn a lot about animals that survive the sea migration, but it cannot tell us what happened to those that died. Acoustic tags can be used on fish as small as smolts, however, the tagged fish must pass within range of an acoustic receiver at a known location for a fish' passage to be recorded. Collaborative partnership projects like the Ocean Tracking Network are working to provide sufficient international acoustic receiver coverage in the ocean to track salmon at sea. This presentation will cover the different forms of electronic telemetry available, their limitations, and provide examples of what we have learned about salmon from studies employing them.